

21. COTS Hardware Maintenance

In this section, discussion of commercial-off-the-shelf (COTS) hardware maintenance support includes COTS hardware procured for the ECS Project and some Government furnished property (GFP).

The following documents are referenced in this section:

- Property Management Plan for the ECS Project 602-CD-001-002
- Functional and Performance Requirements Specifications, 423-41-02
- ECS Performance Assurance Implementation Plan 501-CD-001-004
- Environmental Control Plan for the ECS Project 532-CD-002-001
- Maintenance and Operations Management Plan, 601-CD-001-004
- Version 2.0 Operations Tool Manual 609-CD-003-001
- Version 2.0 COTS Maintenance Plan for the ECS Project, 613-CD-003-001
- Version 2.0 Integrated Support Plan for the ECS Project, 616-CD-002-001
- Replacement Parts List and Spare Parts List 618-CD-002-001

21.1 COTS Hardware Maintenance - General

Overall Responsibility for the management of COTS hardware maintenance rests with the ILS Office. Daily implementation of hardware maintenance policy is the LMC's responsibility. Issues regarding COTS hardware maintenance policy are to be addressed to the ILS manager through the ILS Maintenance Coordinator using contact procedures in the last part of this paragraph.

COTS hardware maintenance consists of preventive and corrective maintenance. The contracted COTS hardware maintenance providers accomplish COTS hardware preventive maintenance. The contracted COTS hardware maintenance providers, or the Local ILS Maintenance Coordinator (LMC) using local DAAC resources, accomplish corrective maintenance. The LMC is the DAAC's focal point for directing and coordinating corrective maintenance of ECS COTS hardware. COTS hardware maintenance support is available from the contracted COTS hardware maintenance providers according to terms specified in the maintenance contracts. Some COTS hardware is not covered by a maintenance contract. This equipment is support by use of DAAC or centralized EDF spares when there is a failure or by time and materials contract support. The LMC ensures that requirements of this section are complied with by all COTS hardware maintenance providers and that accurate and timely information from the DAAC is entered in the Inventory-Logistics-Maintenance (ILM) System. **Instructions on the use of ILM are in chapter 27 of this manual.** The integrated logistics support (ILS) Maintenance Coordinator is a staff position in the ILS office, which is under the Maintenance and Operations

(M&O) manager's area of responsibility. The ILS Maintenance Coordinator is available during East Coast normal work hours to provide assistance and guidance to the LMC in obtaining COTS hardware maintenance when normal efforts have been unsatisfactory. The ILS Maintenance Coordinator may be reached via the Internet, telephone, or FAX with the Internet being the preferred method. The Internet address is ilsmaint@eos.hitc.com; the telephone number is 1-800-ECS-DATA, select option #3 then dial 4180 or 5180. The FAX number is 1-301-925-0741.

21.1.1 Corrective Maintenance

Corrective maintenance is the unscheduled repair of equipment and includes fault detection, diagnosis, isolation, and resolution through line replaceable unit (LRU) repair or replacement. The maintenance of hardware items may be performed on site by the LMC or the contracted maintenance provider, or by returning the failed component to the maintenance depot for repair or replacement. COTS hardware corrective maintenance will be documented using procedures in this section and Section 8.1, Problem Management; Section 9, Configuration Management Procedures and the safety requirements of Section 21.1.4

21.1.2 Preventive Maintenance

EMASS and Storage Technology automated tape library robots are currently the only hardware requiring scheduled preventive maintenance. Preventive maintenance is performed by the original equipment manufacturer (OEM) on this equipment. OEMs are expected to coordinate preventive maintenance visits to the DAAC with the LMC. LMCs will record on the maintenance work orders (MWO) any downtime experienced as a result of preventive maintenance.

21.1.3 Configuration Management

Configuration Management (CM) requirements are addressed in Section 9 of this document. The LMC ensures compliance with the CM requirements resulting from a hardware maintenance action.

21.1.4 COTS Hardware Maintenance Safety

Hardware maintenance will be accomplished in a manner that ensures personnel and equipment are protected from harm. Guidance for establishment of safety practices, standards, and procedures is found in Section 6 of the ECS Performance Assurance Implementation Plan (PAIP), 501-CD-001-004. The LMC will ensure that these safety procedures, as well as applicable local safety requirements, are known and observed by local site support personnel or COTS hardware maintenance providers during COTS hardware maintenance.

COTS hardware safety practices include electrostatic discharge (ESD) protection. The ESD program will be locally developed by the LMC using the ECS Environmental Control Plan, 532-CD-002-001 and applicable DAAC procedures for guidance. When not being worked on or when outside protected areas, electronic parts and assemblies are to be covered by ESD protective covering or packaging. During installation or removal of electronic parts or LRUs, a common ground will be established between the technician, work area, the part, and the equipment it is to

be installed in/removed from. It is the responsibility of the LMC to ensure compliance with these safety procedures by the hardware maintenance provider and site personnel.

21.1.5 Y2K Compliance

All COTS hardware manufacturers have been or are being contacted by the ILS office to certify/verify their product (by part number and or serial number or model) is Y2K Compliant. If a manufacturer replies that certain upgrades are required to archive Y2K compliance (generally firmware) that upgrade is or will be made. If a manufacturer replies that a specific product is not Y2K compliant and will not be made compliant, that product will be replaced. All are expected to be Y2K compliant before 1/1/00.

21.2 COTS Hardware Maintenance - Contract Information

The ECS procurement organization is located at the ECS development facility (EDF) and is responsible for contracting for COTS hardware maintenance. Cost and support considerations may result in COTS HW maintenance being provided by a third party provider. Questions or comments concerning COTS hardware maintenance are to be directed to the ILS Maintenance Coordinator, who can be contacted using contact information contained in Section 21.1, COTS Hardware Maintenance - General.

21.2.1 COTS Hardware Maintenance Contract Database

Information related to COTS hardware maintenance contracts is contained in a database at the the ILS Office and is used to manage maintenance contracts. The LMC can obtain extracts of maintenance contract information via the Internet on the ILS web page at <http://dmserver.gsfc.nasa.gov/ils/intro.htm>. Information fields in the ILS web page are updated periodically by the ILS Maintenance Coordinator.

Generally, COTS hardware maintenance providers require an access code and/or the serial number of the host equipment to verify that the failed item is under a maintenance contract. For example, if maintenance were requested for a computer monitor or keyboard problem, the parent workstation or server serial number would need to be provided as the access code. The information needed by the various COTS HW maintenance providers to verify that maintenance is authorized is stated in the ILS web page. For some COTS HW maintenance providers, names of authorized contact persons are required. The number of authorized contact persons varies with different maintenance providers. The ILS Maintenance Coordinator, in coordination with the LMC, arranges with the COTS HW maintenance provider for specified personnel to become an authorized contact person. It is the responsibility of the LMC to provide to the ILS Maintenance Coordinator the name changes to the authorized contact list as soon as known. The LMC will identify changes as a permanent or temporary change and, if temporary, the inclusive dates of the change. A temporary change may occur when the authorized contact person is ill, on vacation, in training, or other short-term change of work availability status has occurred or is expected to occur.

21.3 Hardware Repairs - Standard

The users and operators of the ECS hardware should report encountered problems to the site's LMC for resolution. The LMC is to provide timely feedback to the user/operator on the outcome of the problem resolution effort. Note: ILM instructions for entering information into the maintenance work order (MWO) are in chapter 27 of this document.

The maintenance role of the LMC includes the following:

- (1) receives notification of HW problems,
- (2) opens and closes MWO
- (3) dispatches the appropriate repair person (system administrator, network administrator, or vendor repair technician).
- (4) updates MWO with repair efforts in a timely manner
- (5) captures, records and reports problems and solutions for future reference - including part numbers, serial numbers, location, and EIN number.

The ILS Maintenance Coordinator does the following:

- (1) tracks MWO status,
- (2) reviews MWO and repair actions for appropriateness and completeness
- (3) requests missing MWO information from LMC
- (4) releases MWO to the ILS Property Administrator for property record action .
- (5) identifies support problem areas.

Users, operators, and support personnel who encounter a HW problem will report the problem according to Section 8 Problem Management. LMCs will create the MWO in ILM using procedures contained in Chapter 27.

21.3.1 Hardware Problem Reporting

Once failure occurs, the operator, SA and/or NA will isolate the problem to its source (i.e., Operating System, COTS application software, ECS custom software, science software, network, or COTS hardware) using the actions in Table 21.3-1, Daac Hardware Problem Reporting Procedures. **Workflow process chart A, can be located at the end of this chapter illustrates DAAC Hardware Problem Reporting.**

Table 21.3-1. DAAC Hardware Problem Reporting Procedures

Step	Occurrence	Action
1	System problem discovered by an operator, Sys. Admin. or NW. Admin and User Services Office who then.	<ul style="list-style-type: none">a. Issue a DDTS Trouble Ticket to SA, NA or LMCb. Reviews error message against the applicable hardware/software operator manual.b. Verifies that power, network, and interface cables are connected and functioning properly.c. Runs internal systems and/or network diagnostics.d. Reviews system logs for evidence of previously related problems or configuration changes that may be contributing to the problem.e. Attempts to reboot the system.f. If problem is fixed completes a Remedy Trouble Ticket using Section 8 procedures.g. If the problem is determined to be hardware related, either prepares an MWO or notifies the LMC. The LMC will prepare an MWO with status code "O" for open and either notifies the maintenance contractor or replace failed component with on-site-spare (if available).h. Notifies the ILS PA that the parts have arrived

21.3.3 Hardware Corrective Maintenance Actions

Hardware problems are forwarded to the LMC. The LMC will attempt to identify the cause of the problem and employ DAAC resources to resolve the problem. If unable to correct the problem using DAAC resources, the LMC arranges for on-site maintenance by the appropriate maintenance provider in accordance with Section 21.3.4, Contract On-Site Hardware Maintenance. **Work flow process chart A-1 located at the end of this chapter, illustrates the flow of Hardware Corrective Maintenance.**

Table 21.3-2. Hardware Corrective Maintenance Actions (1 of 2)

Step	Occurrence	Action
1	COTS hardware problem not resolved by initial trouble-shooting by operator, SA or NA.	<ul style="list-style-type: none">a. LMC contacted or notified via MWO or by operator, SA or NAb. LMC opens MWO and adds any cross-reference information for related open Remedy Trouble Ticket (if existing)

Table 21.3-2. Hardware Corrective Maintenance Actions (2 of 2)

Step	Occurrence	Action
2	LMC attempts to identify cause of problem.	<ul style="list-style-type: none"> a. Reviews the MWO (if one was initiated by operator, SA or NA). b. Verifies actions and results to date by contacting SA and/or NA and by accomplishing the following: <ul style="list-style-type: none"> 1) Perform initial troubleshooting, including that described in the equipment manuals. 2) Record results in the MWO.
3	Problem resolved by LMC or local staff.	<ul style="list-style-type: none"> a. If problem can be resolved without hardware replacement (e.g. re-seat component, cable, etc): <ul style="list-style-type: none"> 1) Correct problem, verify resolution. 2) Record actions taken and enter status code "A" in the MWO b. If problem can be resolved by replacement of failed LRU with maintenance spare: <ul style="list-style-type: none"> 1) Replace failed LRU and record following in MWO: <ul style="list-style-type: none"> a) Part number, serial number, and model/version number of replaced LRU b) Part number, serial number, and model/version number of new LRU c) Down time (elapsed hours/minutes) d) Delay time identified by reason 2) CM requirements are accomplished following procedures in Section 9. 3) Order replacement of failed LRU in accordance with Section 21.4.1. 4) Route failed LRU in accordance with Section 21.4.2. c. LMC records actions taken to resolve the problem in the MWO d. LMC forwards completed MWO by recording status code "A"
4	Staff does not resolve hardware problem.	<ul style="list-style-type: none"> a. LMC notifies the maintenance contractor using the information from the ILS web page, providing the telephone number of the vendor and access code needed to obtain support for delivery of a replacement component (whichever the contract specifies) b. LMC invokes return-to-depot support where appropriate, c. LMC request authorization from ILS Maintenance Coordinator for use of Time and Materials support if that is needed. d. LMC will recording all the information in the MWO such as make, model, serial number, description of problem and criticality of the problem

21.3.4 Contract On-Site Hardware Maintenance

When on-site hardware maintenance support is necessary, the LMC will notify the applicable maintenance contractor and request assistance. The call for support will be documented in the MWO by the LMC, noting the date and time the contractor was called. It is important that all

vendor maintenance activities start and stop times associated with the activities are recorded in the MWO. This is the only means of measuring, and managing the maintenance vendor's contractual performance in support of the ECS system availability goals. Data fields have been specifically created in the MWO to capture this information. See Table 21.3.4-1 for more information about obtaining on-site COTS hardware maintenance support. **The work flow process charts A-2, B, B-1, located at the end of this chapter illustrates the flow of Obtaining and Maintaining on Site Support.**

Table 21.3.4-1. Obtaining On-Site Hardware Maintenance (1 of 3)

Step	Occurrence	Action
1	Local support effort did not resolve the problem.	<ul style="list-style-type: none"> a. LMC gathers information needed to obtain contract maintenance support and records it in the MWO. <ul style="list-style-type: none"> 1) Make, model, serial number, and location of failed systems. 2) Description of problem and symptoms. 3) Criticality of the COTS hardware experiencing the problem. b. Using information from the ILS web page the LMC determines: <ul style="list-style-type: none"> 1) Name of maintenance provider 2) Telephone number of the maintenance provider's technical support center 3) Access code needed to obtain support. 4) Site authorized contact person(s).
2	LMC calls the appropriate support provider's technical support center for maintenance.	<ul style="list-style-type: none"> a. Provides information from Step 1a above to the maintenance provider to establish a need for on-site support. b. Obtains a case reference number from the COTS hardware maintenance provider c. Informs the providers technician to supply a copy of dispatch trouble ticket with company name, date/time of arrival and departure, PN and SN of all equipment removed and or installed, and a narrative of problem and actions taken, d. Updates the MWO to reflect time and date of the call all actions and case reference number
3	LMC actions	<ul style="list-style-type: none"> a. Jointly determine between maintenance contractor and site operations staff an acceptable time to bring the equipment down for maintenance. <ul style="list-style-type: none"> 1) Obtain tentative time from operations, then obtain concurrence from appropriate maintenance contractor. 2) Obtain information from the maintenance vendor such as date and time of arrival reference number and actions needed to be accomplished prior to technicians arrival 3) Repeat process until an agreed upon maintenance time is obtained

4	Maintenance technician arrives at the site.	<ul style="list-style-type: none"> a. LMC arranges for site access using local established procedures. b. Records arrival time in MWO.LMC request for a copy of dispatch trouble ticket with company name, date/time of arrival and departure, part number & serial number of all equipment removed and or installed and narrative of problem and action taken. c. LMC request System Administrator, site Help Desk or other appropriate functional to shut down the machine when required accomplishing corrective maintenance. d. LMC escorts maintenance technician to the hardware e. Ensures maintenance provider's technician places LRU's on an antistatic mat when working on them. f. Ensures the maintenance provider technician places anti-static strap on wrist and connect to a common ground when handling LRU's that can be adversely effected by an electrical charge g. LMC assists the maintenance technician in resolving the problem. This includes: <ul style="list-style-type: none"> 1) Arranging for a demonstration of the problem (if possible) 2) Arranging for the equipment to be shut down. 3) Obtaining site available technical references, when needed
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Table 21.3.4-1. Obtaining On-Site Hardware Maintenance (2 of 3)

Step	Occurrence	Action
6a	Maintenance technician corrects the problem by replacement of parts.	a. If a part is replaced, the LMC accomplishes the following: <ol style="list-style-type: none"> 1) Obtains from the failed part or the maintenance technician: <ol style="list-style-type: none"> a) serial number, equipment identification number (the EIN number on the silver label), and model/version 2) Obtains from the new part: <ol style="list-style-type: none"> a) part number, serial number, and manufacturer's model number (if different from part removed, a configuration change request [CCR] is required) 3) Updates the MWO with following information: <ol style="list-style-type: none"> a) actions taken to correct the problem. b) part number, serial number, and model/version, and EIN (if applicable) of the old and new item c) name of the item replaced d) arrival date and time e) time and date corrective action started f) time and date corrective action completed g) any delay time experienced in completing the corrective action and reason for delaytime to repair
6b	Maintenance technician corrects the problem without replacement of parts	a. If no parts were replaced, the LMC updates the MWO with: <ol style="list-style-type: none"> 1) Actions taken to correct the problem. 2) Time and date technician arrived 3). Time and date repair was started and completed
6c	LMC request the to have the system functional	a. Sysadmin to restore data, operating system, patches or other SW items to render the system functional. b. Annotates that the MWO that the sysadmin has been notified to restore data or the completion of the requirement if completed while there
6d	Maintenance technician does not resolve the problem	a. LMC request the Maintenance vendor provide additional technical and or managerial resource to resolve the problem after repair efforts have been underway for 24 hours without resolution. b. LMC documents all escalation activity in the MWO until further action is taken
6e	LMC ensures	a. Receipt of a completed copy of the dispatch trouble ticket from the vendor b. The information from the vendor's ticket is consistent with the information in the MWO

Table 21.3.4-1. Obtaining On-Site Hardware Maintenance (3 of 3)

7	LMC	a. Update the MWO with the following information 1) When the call was made and to which support provider 2) Date and time technician made initial contact 3) Date and time providers technician arrives 4) ALDT reason and duration 5) When repair is complete and support technician leaves 6) Hours chargeable to hard down time and soft down time.
8	LMC reports actions taken	a. Obtain the authorization of the operation supervisor to make the change b. Ensures the Configuration Control Board is properly notified of the configuration alterations and requests a formal change using procedures in Section 8.
9	LMC forwards	a. A completed MWO to the ILS Maintenance Coordinator via nightly updates to the SMC by changing status code on MWO to "A". b. A copy of MWO and the vendor's dispatch trouble ticket
10	LMC files	a. A copy of vendors dispatches sheet and related documents in a permanent file and references the MWO or files them with a copy of the MWO.
11	LMC verifies	a. Property changes resulting from the MWO are recorded in subsequent updates to it property inventory report.

21.3.5 Return-to-Depot Support

In some cases the OEM does not provide on-site maintenance. Instead, return-to-depot maintenance support is provided whereby an advance replacement LRU is requested from the vendor by the LMC prior to returning the failed repair. If advance replacement is not provided, then the LMC must return the failed item to the appropriate repair center using procedures contained in Section 21.4-2. **Work flow process charts C and D located at the end of this chapter illustrates the flow of Returned to Depot for Service and Equipment Advance Replacement.**

Table 21.3.5-1. Procedure for Obtaining Return to Depot Service

Step	Occurrence	Action
1	LMC contacts	a. The appropriate hardware maintenance provider, using information from the ILS WEB page (reference Section 21.2.1 COTS Hardware Maintenance Contract Database).

2	LMC requests	<ul style="list-style-type: none"> a. Advance replacement LRU from the appropriate hardware maintenance provider with shipping instruction prior to returning the failed repair. b. Annotate the expected delivery time, RMA #, and carrier information failed item PN, SN EIN's and action as they become available in the MWO
3	LMC receives	a. New LRU with RMA authorization.
4	LMC packs	<ul style="list-style-type: none"> a. The failed LRU using the carton containing the new item following instructions received with the advance replacement part. b. Remove the NASA Property sticker, (silver in color) (also called EIN Tag number) for destruction prior to packing the item for shipment and annotates in MWO.
5	LMC applies	a. Address label furnished with advance replacement to the carton
6	LMC enters	a. RMA number to the carton containing the part to be returned (if not already entered on the address label) in the MWO.
7.	LMC packs	a. The box with the failed item and states a brief description of the problem ion the package
8	LMC annotes	<ul style="list-style-type: none"> a. The MWO with RMA# date shipped to vendor and expected receipt or return of item with a description of the problem b. Update Inventory changes to the hardware in the MWO when the receives and reinstalls the repaired unit c. Forwards the MWO to the ILS MC by entering status code "A" on the MWO. d. When he receives the repaired unit and reinstalls the unit with all the date information.

Table 21.3.5-1. Procedure Equipment Advance Replacement

Step	Occurrence	Action
1	LMC request	a. The appropriate hardware maintenance provider, using information from the ILS WEB page (reference Section 21.2.1 COTS Hardware Maintenance Contract Database) to provide advance replacement if on-site support is not contracted..
2	LMC assures	a. MWO is annotated with failed items part number, serial number EIN action as they become available.
2	LMC obtains	a. RMA number and shipping instructions from the repair vendor
3	LMC receives	a. New advance replacement with RMA authorization and it is received and installed.
4	LMC packs	a. The failed LRU using the carton containing the new item following instructions received with the advance replacement part. Remove the NASA Property sticker, (silver in color) (also called EIN Tag number) for destruction prior to packing the item for shipment.
5	LMC applies	a. Address label furnished with advance replacement to the carton
6	LMC enters	a. RMA number to the carton containing the part to be returned (if not already entered on the address label , date shipped to vendor and expected receipt or return of item

7	LMC logs	<ul style="list-style-type: none"> a. Update information in the MWO (cite RMA # and return address) date shipped to vendor and expected receipt or return of item. b. Packs the boxes of the failed items and states a brief description of the problem
8	LMC updates	<ul style="list-style-type: none"> a. The MWO status to "A" for Audit with the new information and when he receives returned unit and reinstalls the repaired unit.

21.4 Maintenance Spares

The maintenance contractor performing the maintenance normally provides replacement LRUs. However replacement LRUs will typically be obtained from within the metropolitan area where the DAAC is located, and will seldom be stocked on the DAAC site.

The ECS ILS Office may procure selected maintenance spares to provide a more rapid return to service for failed critical units and to guarantee their availability. These spares are to be used as a last resort and must be replaced quickly. The ECS ILS Office will also procure selected spares for hardware items that do not have contracted on-site maintenance. Project spares may be centrally stocked at the EDF, stored on-site in the DAAC property room, or reside as installed spares in equipment.

Maintenance spares are procured and replenished by the ECS ILS Office using the process identified in Paragraphs 4.6.3 and 4.6.4 of Release B COTS Maintenance Plan, document 613-CD-003-001; and Section 23, Property Administration of the 611 document. Spares allocated to the DAACS will be managed at the DAAC by the LMC using guidance from the above referenced documents and appropriate local DAAC policies and procedures.

21.4.1 Use of Maintenance Spares

The LMC will control the use of on-site maintenance spares. Centrally stocked spares can be requested from the ILS Maintenance Coordinator using procedures in Section 21.1. Installation of maintenance spares is performed by the LMC (if qualified) or the COTS hardware maintenance contractor under oversight of the LMC, who ensures procedures in Section 21.3 are followed. **Work flow process chart E, located at the end of this chapter illustrates the Centrally Stocked Spares**

Table 21.4.2-1. Centrally Stocked Spares

Step	Occurrence	Action
1	LMC Opens	<ul style="list-style-type: none"> a. An MWO to request a spare with a reason and description of the problem. In the MWO places an "O" as OPEN and sends an email to ILS MC
2	LMC receives	<ul style="list-style-type: none"> a. An email from the ILS MC authorizing the shipment of the spare from the ILS PA .
3.	LMC ensures	<ul style="list-style-type: none"> a. Individuals installing and removing the spare must adhere to Electrostatic standards by standing on and antistatic mat with anti static wrist connection with a common grounding

4	LMC receives	a. The spare from the ILS PA and ships the failed LRU to the ILS PA or the repair vendor as directed by ILS PA or ILS MC
5	LMC prepares shipping label	a. On the carton prominently displaying the RMA if required. The shipping address may differ from the maintenance contractor's main address.
6	LMC removes	a. Just prior to packing the failed spare for return to factory repair or ILS PA remove the NASA property sticker (silver in color) (also called the EIN tag) for destruction and so note on the MWO.
7.	LMC annotates	a. MWO with repair information such as start, end and delay time, part number, serial number of removed/installed items
8.	LMC ensures	a. System is return to operational status b. System admin will restore data, operating system, patches or other SW items to render the system functional c. Maintenance vendor will provide additional technical/and or managerial resources to resolve the problem after repair efforts have been underway for 24 hours without resolution d. All escalation activity is annotated in the MWO
9	LMC receives	a. The spare from the ILS PA or vendor
10	LMC applies	a. The new EIN tag number (New NASA Property sticker)
11	LMC updates	a. The MWO with the EIN and replacement component information such as start, end and delay time, part number and serial number of item removed/installed and forwards the MWO by entering status code "A".

21.4.2 Return of Failed LRUs

The LMC is responsible for the return of failed LRUs to maintenance contractors providing advanced replacement depot maintenance support (e.g., systems under return-to-depot support). In such agreements the maintenance provider sends to the site a replacement for a failed component under the condition that the site will return the failed component within a reasonable time, usually not greater than 10 days. If the failed component is not returned the contract is charged the full purchase price for the item not returned.

Table 21.4.2-1. Return of Failed LRU

Step	Occurrence	Action
1	LMC contacts	a. The appropriate hardware maintenance provider using the information on the ILS web page (see Section 2.1.2.1).
2	LMC returns	a. Failed LRU using procedures in table 21.3-4 or if advance replacement support is not provided, the LMC requests an RMA # and shipping address from the maintenance provider.
3	LMC attaches	a. A brief description of problem to the failed LRU.
4	LMC removes	a. Just prior to packing the failed LRU for return to factory repair, remove the NASA property sticker (silver in color) (also called the EIN tag) for destruction and so note on the MWO.
5	LMC will	a. Once RMA # is in hand, arrange for the return for the failed LRU to the specified repair facility.

6	LMC packs	a. The failed LRU in a manner that minimizes the chance that the item will be damaged in shipment.
7	LMC prepares shipping label	a. The shipping label will be placed on the carton prominently displaying the RMA. The shipping address may differ from the maintenance contractor's main address.
8	LMC sends	a. Package to specified repair facility.
9	LMC receives	a. The repaired or replaced item from the vendor
10	LMC applies	a. The new EIN tag number (New NASA Property sticker)
11	LMC updates	a. The MWO with the EIN and replacement component information and forwards the MWO by entering status code "A".

21.5 Non-standard Hardware Support

Non-standard COTS hardware support consists of maintenance support outside the PPM (support incurring time and materials charges) or escalated support actions by the maintenance support provider. **Work flow process chart F located at the end of this chapter illustrates the flow of Time and Material Support.**

Table 21.3.5-1. Procedure for Time and Material Support

Step	Occurrence	Action
1	LMC contacts	a. The ILS MC to request for Time and Material support.
2	ILS MC determines	a. If the problem is critical enough to justify Time and Material Support and then give the LMC verbal and written approval to use Time and Material support. b. Approval may contain a dollar limit, time limit and or approval reference number
3	LMC contacts	a. The appropriate vendor for Time and Material support and once the service has been rendered. b. LMC faxes or email the information on the service call.
4	ILS MC creates	a. Quarterly reports of Time and Material support including funding used and briefs the CCB on the funds status quarterly..

21.5.1 Escalation of COTS Hardware Support Problem

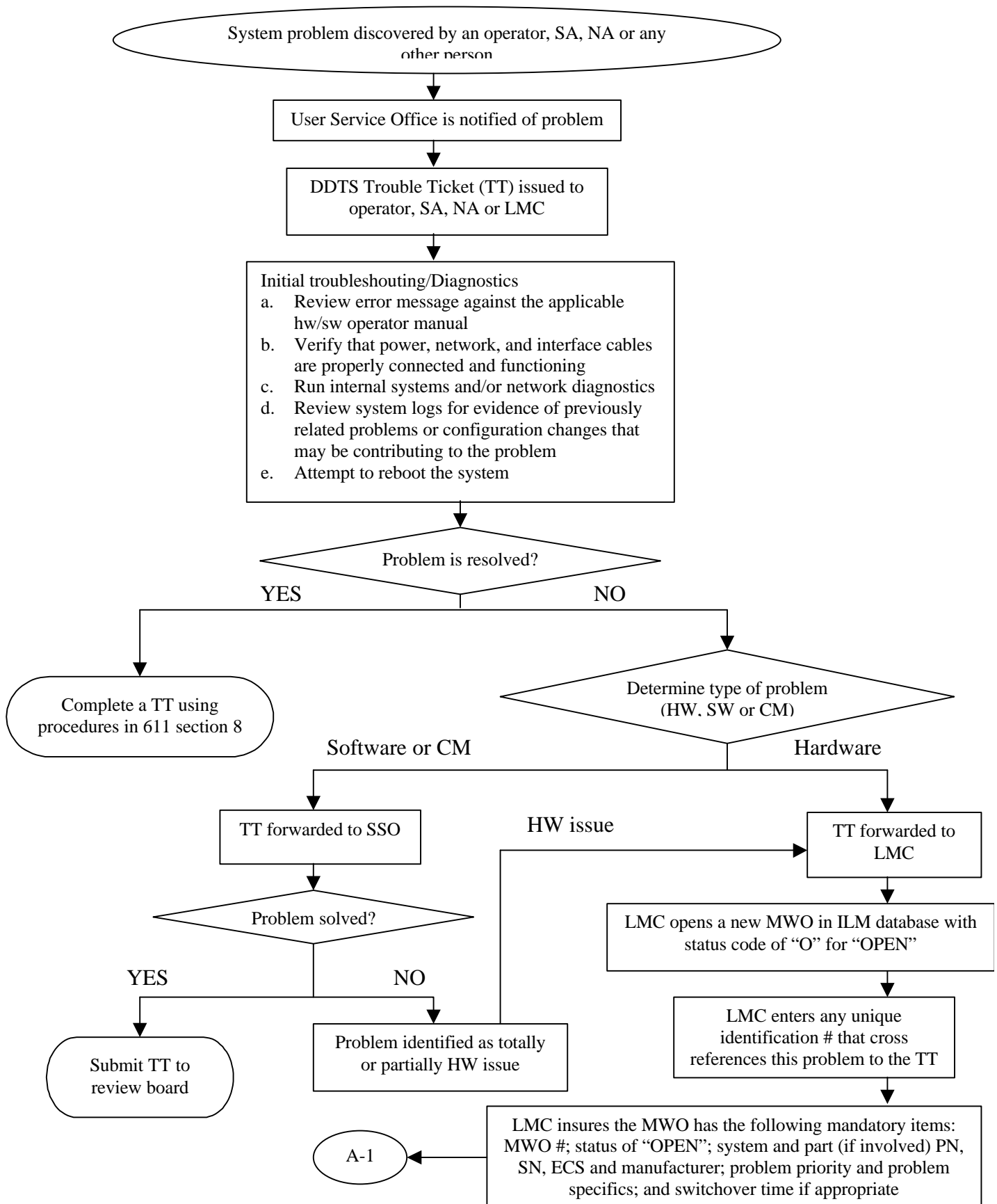
Hardware support providers have escalation policies based on elapsed time from start of the corrective effort. The escalation policies direct increased management attention and/or resources to the problem, which is relatively invisible to the DAACs. Escalation of a hardware support provider's efforts that may also be requested anytime the corrective effort is not progressing satisfactorily. The LMC may request escalation by calling the maintenance contractor's technical support center and providing the case number generated when the problem was first reported. The LMC may request assistance from the ILS Maintenance Coordinator in obtaining a satisfactory resolution by using procedures in paragraph 21.1.

21.5.2 Uneconomically Repairable Equipment

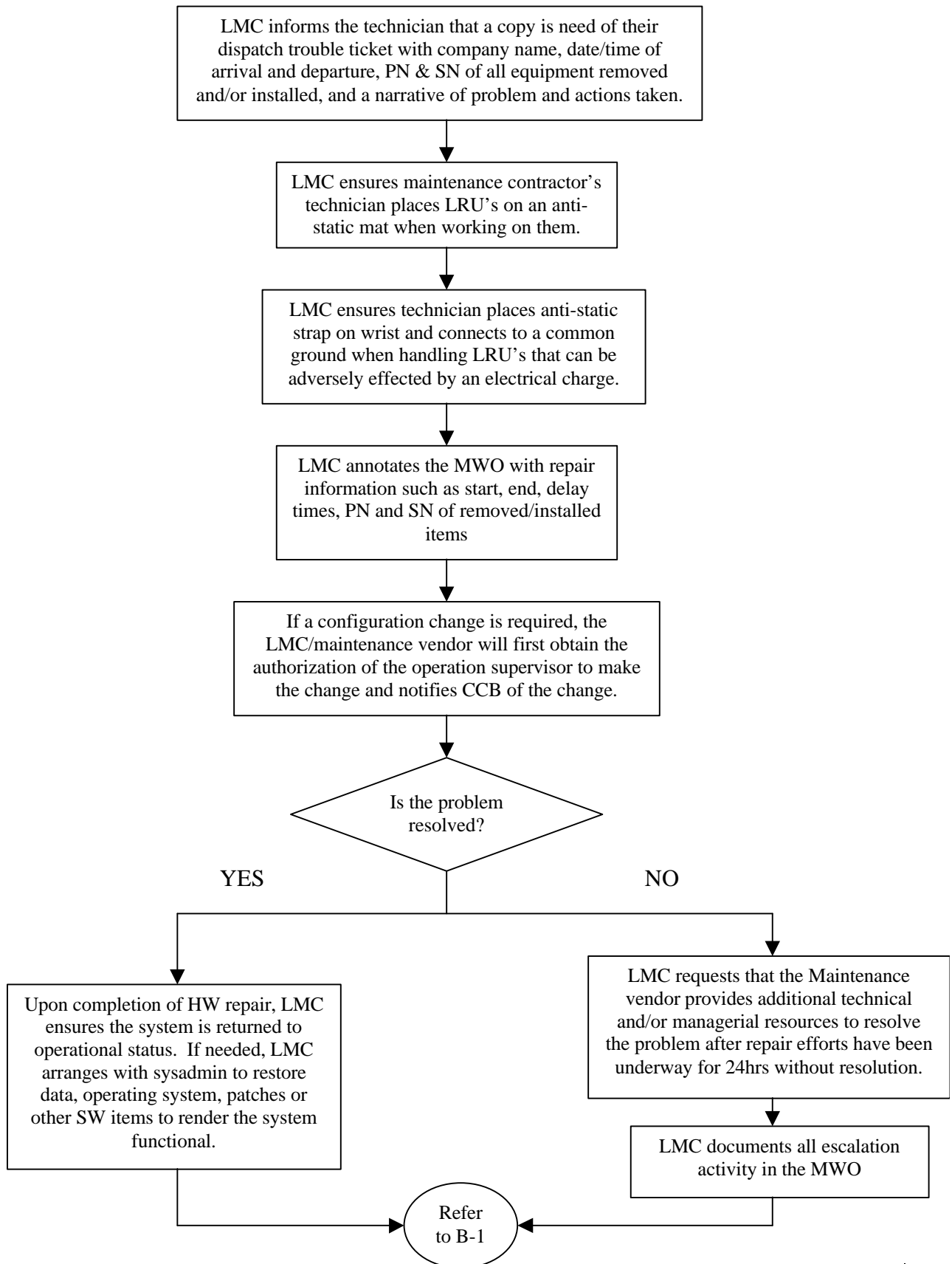
Some equipment items are not cost effective to support through maintenance contracts and are also considered not economically repairable. These items include Wyse terminals, keyboards, and mice. Such items, when support by the maintenance vendor is replaced as part of the contract. When not covered under maintenance contract, they will be replaced by the ILS Office through spare replenishment. However, maintenance spares, because they are Government property, will not be disposed of without the direction of the Government. LMCs will request disposition instructions for these items from the ILS Office. They will not be discarded without specific direction from the ILS Office. The disposition request will be made by the LMC following procedures in Section 23 and Property Management Plan for the ECS Project , document 194-602-OPI-001.

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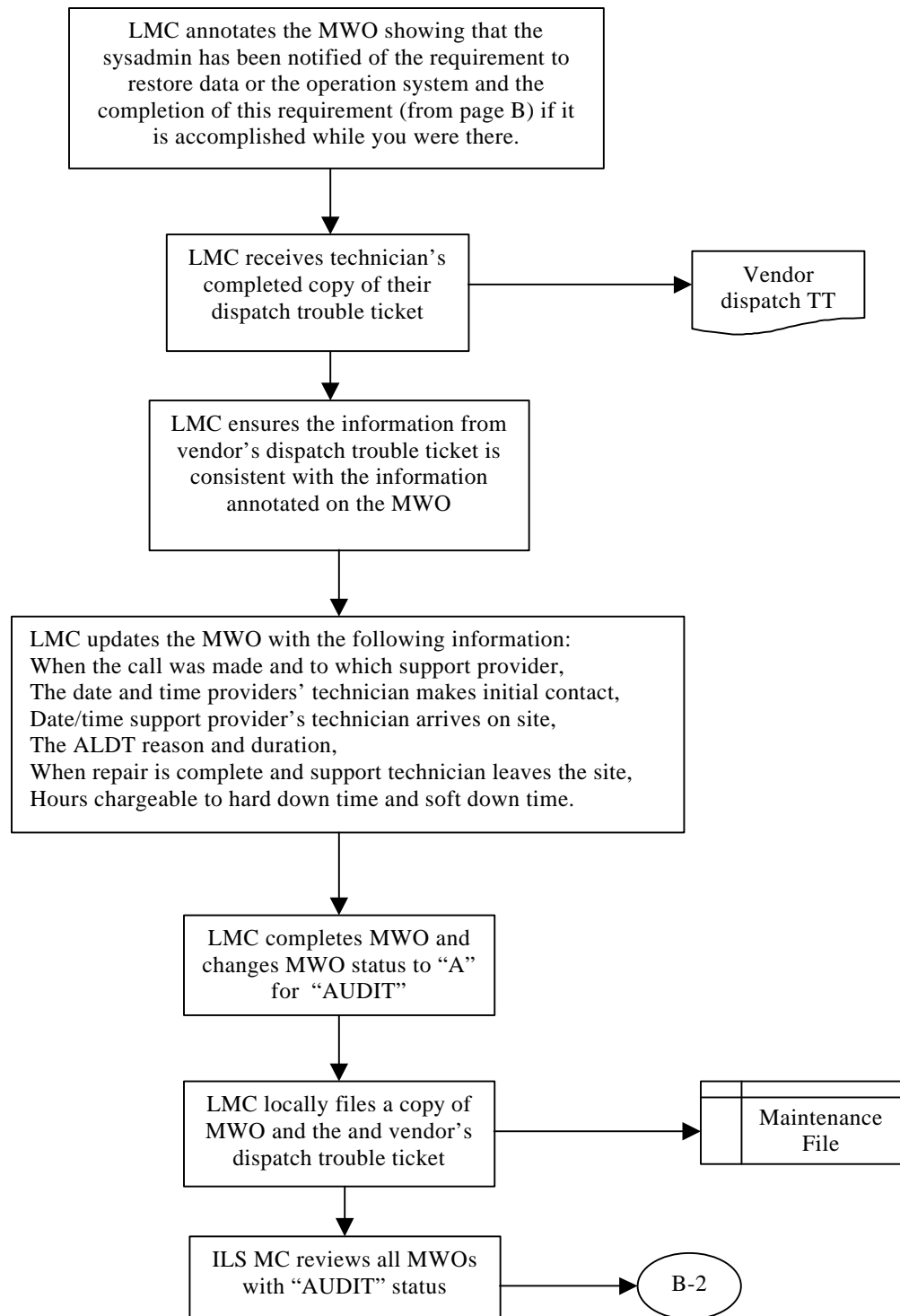
DAAC HARDWARE PROBLEM REPORTING (A)



On-Site Maintenance Support (B)

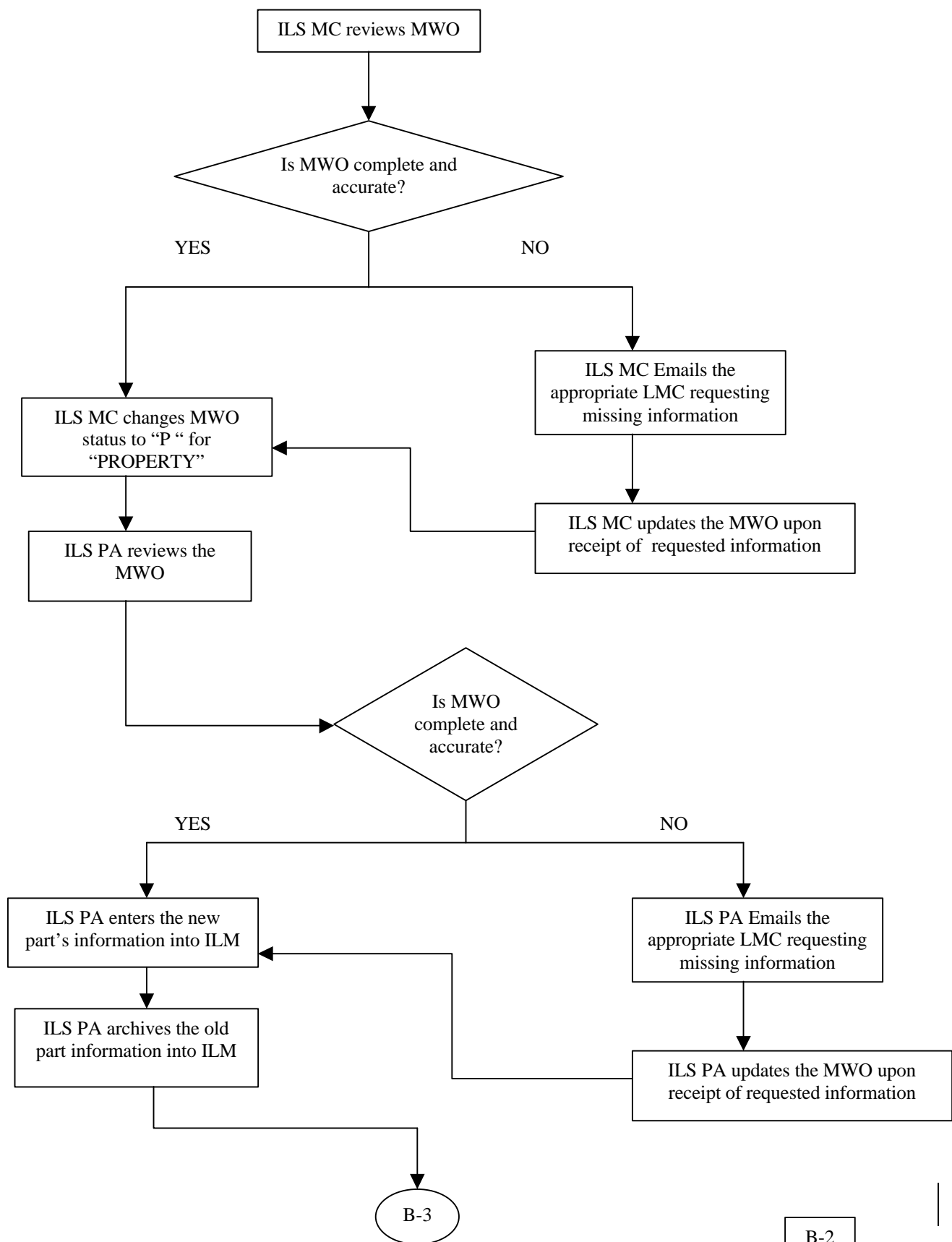


On-Site Maintenance Support (B-1)

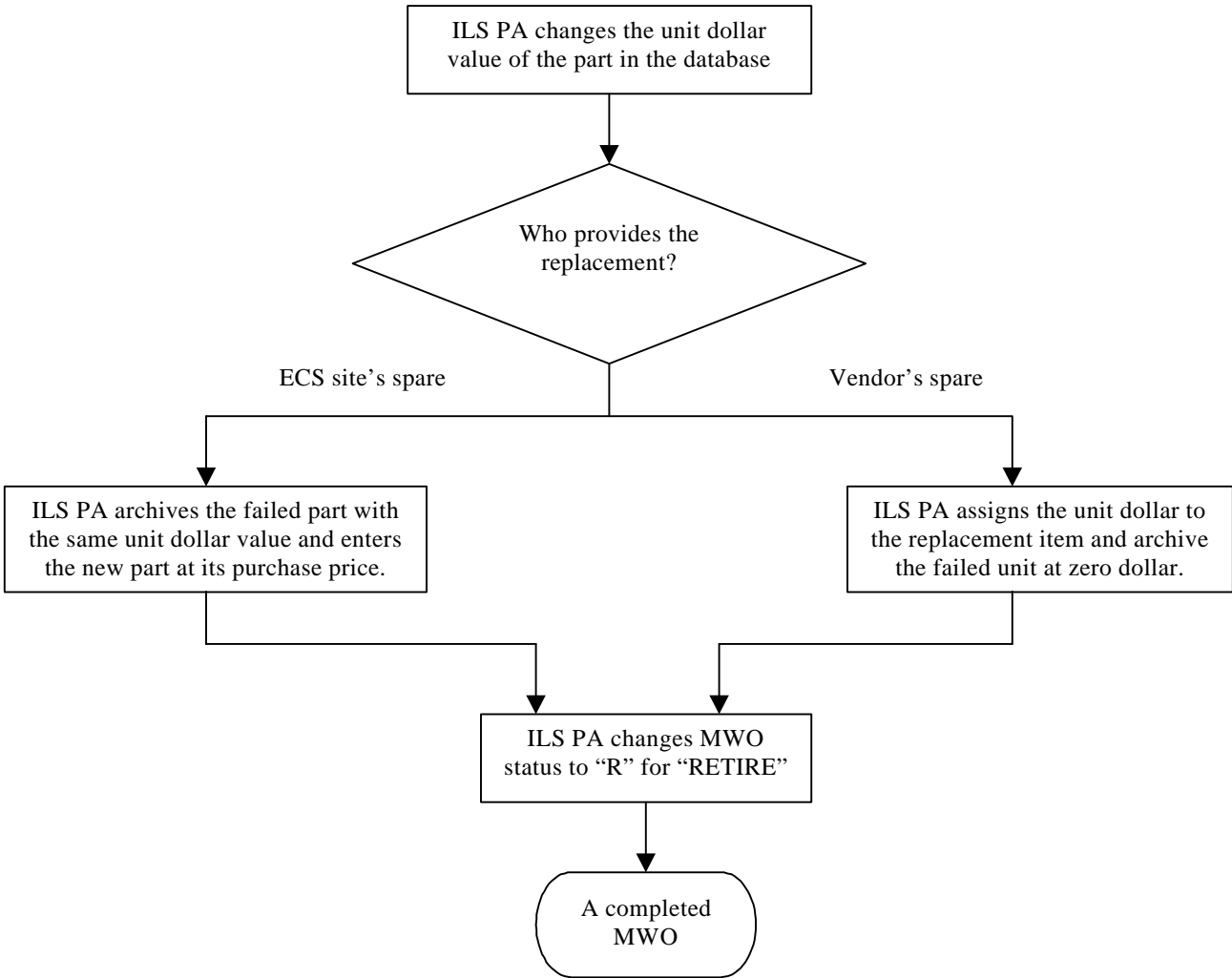


B-1

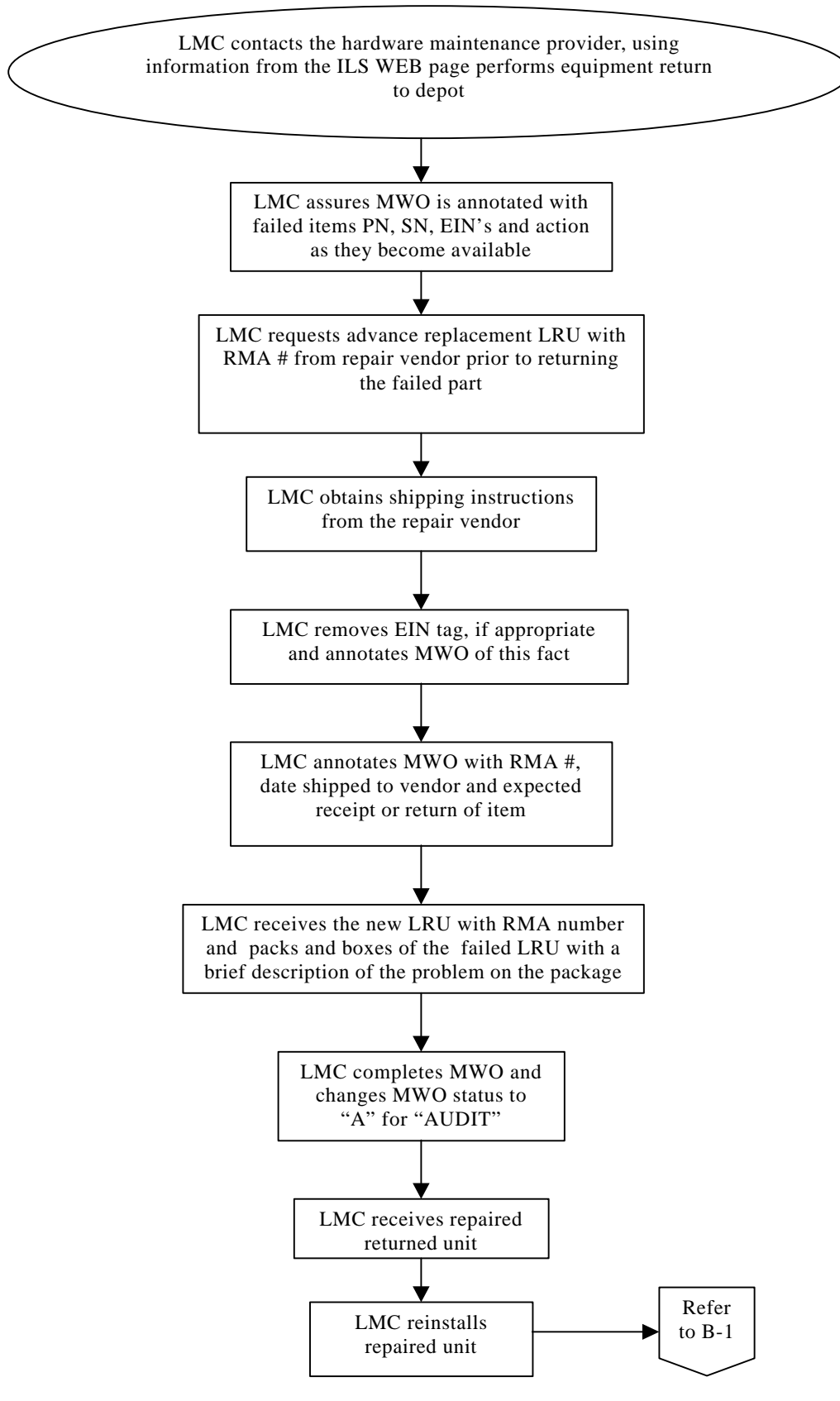
On-Site Maintenance Support or Site Depot Support (B-2)



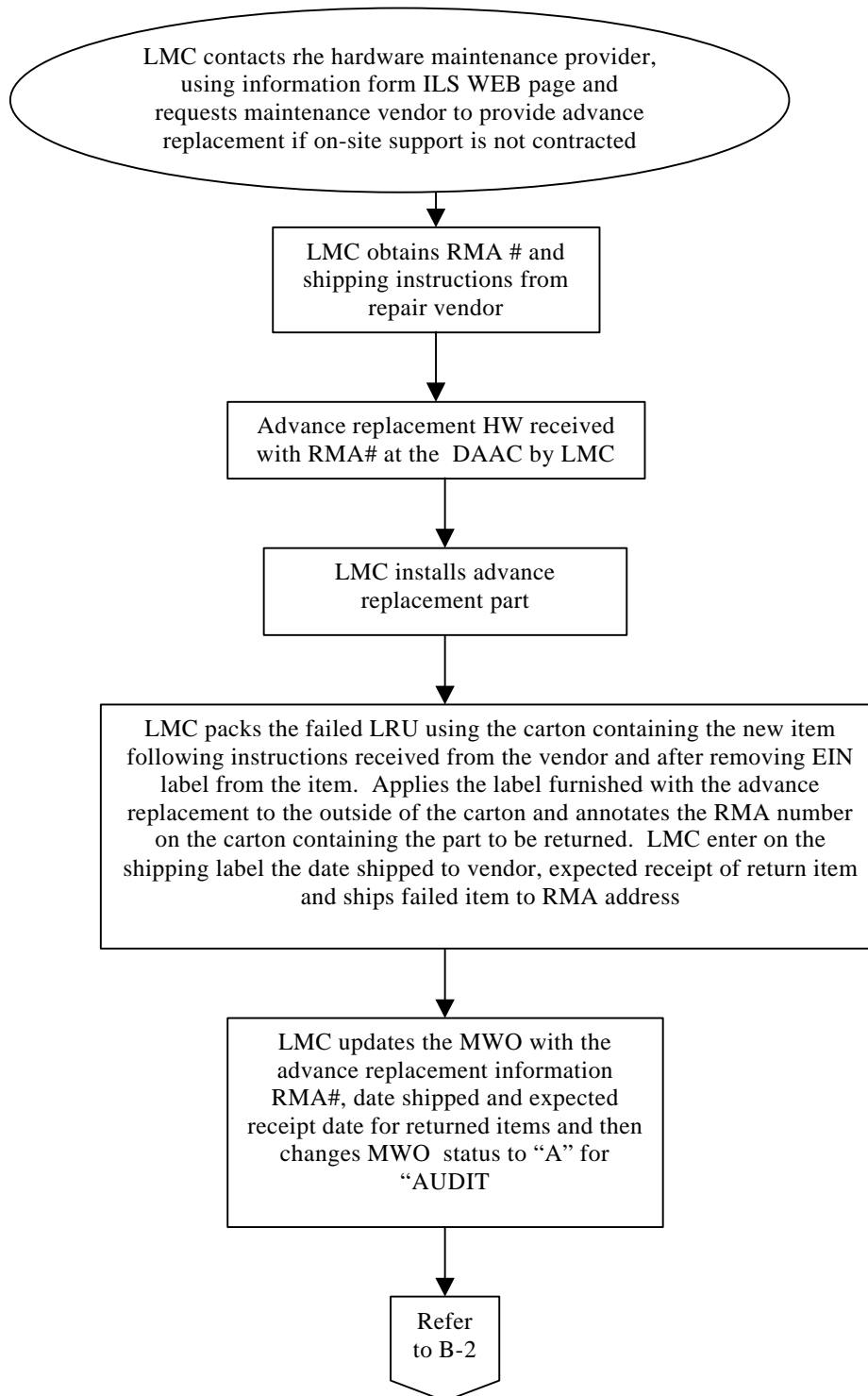
On-Site Maintenance Support or Site Depot Support (B-3)



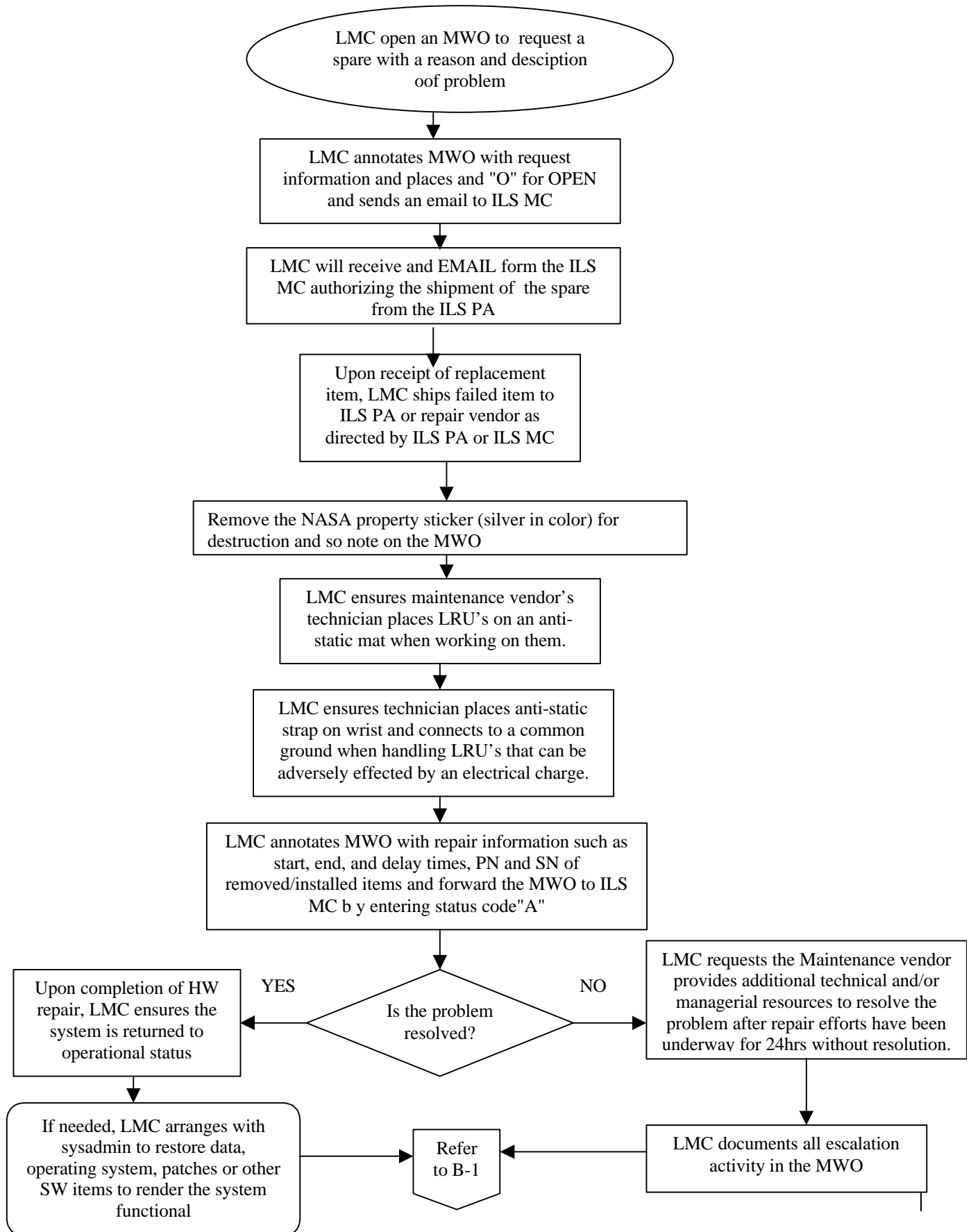
Equipment Returned to Depot for Service (C)



Equipment Advance Replacement (D)



Replacement Item Provided by EDF Centrally Stocked Spares Inventory (E)



Time & Material Support (F)

